ATOMIC ENERGY Newsletter

THE FIRST AND ONLY

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September 8th, 1953
Vol 10...No. 5

Dear Sir:

The fourth exclusively fission-type nuclear weapon was detonated last fortnight by the Soviet Union, in experimental work. It was detected through United States, Canadian, and British monitoring efforts, utilizing both ground and airborne instrumentation. (In addition to the Soviet's four fission-only detonations, a combination fission and fusion device was detonated the middle of last month, by the Soviet Union.) This most recent fission detonation (another having occurred in Sept. 1949, with two in Oct. 1951) was of a high order of energy release. It was part of a series of tests being made of such devices within the Soviet Union.

An aircraft nuclear propulsion department has now been set up by General Electric Co., at its Evandale plant in Cincinnati. Although G-E has been active in aircraft nuclear propulsion work since 1951, the volume of such work did not warrant departmental status. With the increasing load that the aircraft nuclear propulsion unit is being burdened with, the decision was made to give the project the larger importance of a department. Head of the department is D. Roy Schoults, the nuclear project leader since its inception at G-E. (Work at Evandale, which ultimately will result in construction of a nuclear power plant for an aircraft, has been preceded by many years of experimental work and theoretical studies on this subject, both U. S. Air Force-and USAEC-sponsored.)

A new uranium rush is now underway in New Brunswick. The area which has attracted this interest is near Hampton, about 30-miles east of St. John. Some 25-27-sq. miles have already been staked there, in the last fortnight, mostly on the basis of Geiger counter readings of from three to six times background. Assays made so far have reported 0.11% uranium oxide equivalent across 2-ft., and 0.09% uranium oxide equivalent over 3-ft. (Other RAW MATERIALS news, page 4 of this letter.)

A new series of basic courses in the techniques of using radioisotopes in research are to be offered by Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn., starting January 4th, February 8th, and March 15th, 1954. The courses are offered to enable mature research people to obtain in four weeks (the course duration) sufficient facility in the use of radioisotopes to apply them safely and efficiently to their own research problems, as well as to impart the training to others. For this reason the course has been designed for university faculty members, group leaders of research teams, etc. Inquiries concerning the courses may be made to the Institute, at Oak Ridge.

A number of papers covering work at nuclear installations and laboratories are now to be presented at the National Instrument Conference, Chicago, Sept. 21-25. "A Neutron Thermopile" will be discussed by J. T. Lorenzo, of Oak Ridge National Laboratory, and T. R. Herold, of du Pont's Savannah River project; "Instrumentation for Radiochemical Processing-Recovery of Iodine-131" will be discussed by J. N. Baird, Jr., Oak Ridge National Laboratory; and "Liquid Metal Magnetic Flowmeters" will be covered by W. C. Gray, and E. R. Astley, of General Electric Co., Schenectady. (Page 3 this LETTER, for nuclear instrument exhibitors at the concurrent Instrument Society of America's Chicago exhibit.)

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BUSINESS NEWS...in the nuclear energy field...

OPERATIONAL CONTRACT MODIFIED: Union Carbide & Carbon's existing contract with the USAEC, which was first set up in January, 1943, has again been modified, and extended to June 30th, 1957. The new modification adds to Carbide's present operational work at Oak Ridge the K-33 addition to the gaseous diffusion plant, and smaller facilities at the Y-12 electromagnetic separation unit, both at Oak Ridge. The new contract also makes Carbide operational contractor at the second gaseous diffusion plant at Paducah, Ky., which is now under construction, and completion of which is estimated for the Fall, 1954. Carbide now operates the older K-25 and K-27 plants at Oak Ridge, as well as the newer K-29 plant there, all of which produce uranium-235 by the gaseous diffusion process. In addition, Carbide operates the Oak Ridge National Laboratory, and portions of the old Y-12 electromagnetic separation unit, both at Oak Ridge. Carbide also operates the first gaseous diffusion unit at Paducah, Ky., which went on stream some 6-months ago.

Other features of Carbide's new contract are in connection with the new gaseous diffusion plant near Portsmouth, in Pike County, Ohio, now being constructed, and which will be operated by Goodyear Tire & Rubber Co.'s newest subsidiary, Goodyear Atomic Corp. Here, the contract covers such services as process design, development, and engineering; design, engineering, and assistance in procurement of process equipment for the three plants; and provisions for technical assistance to Goodyear.

The financial picture for Carbide, through its present USAEC contracts, indicates that Carbide's annual "fixed fee" (net profit, before taxes) for its work as a USAEC contractor now approximates $2 million. An analysis of fees received by other USAEC contractors, operating under similar cost-plus fixed-fee negotiated contracts, shows that "atomic-profit-wise", Carbide may be in the most favorable position of any such contractor.

CHANGE IN CONTRACT AT TESTING STATION: Operation of the chemical processing plant, at the National Reactor Testing Station, Arco, Idaho, is to be given over to Phillips Petroleum Co. this October 1st. The plant is now under the management of American Cyanamid Co. Final negotiations with Phillips Petroleum are now underway, and, when completed, Phillips will hold a cost-plus type contract for a 5-year period. Phillips will also take over, in addition, certain services, including transportation, warehousing, etc., which are now done by others.

NEW TELETHERAPY UNIT COMPLETED: Following completion by the W. F. and John Barnes Co., Rockford, Ill., of a teletherapy unit designed for a 300- to 600-curie radiocobalt source, tests are now to be made by the medical division of the Oak Ridge Institute of Nuclear Studies, Oak Ridge, (ORINS) with the unit. Designed by the Barnes organization, to the specifications of the Teletherapy Evaluation Board (composed of representatives of 20 medical schools and ORINS) it is expected to be produced in quantity by Barnes following these tests. Although a number of radiocobalt teletherapy units are already in operation, the Barnes unit is an attempt to take radiocobalt therapy out of the experimental category and to make it available to practicing radiologists. Units now in use are in the 1000-curie region, and are not designed for routine therapy.

The Barnes unit, which is designed for convenient treatment of head and neck lesions, consists essentially of a steel-encased lead sphere about the size and shape of a diver's helmet. A tube, six inches long, protrudes from the sphere. A connecting arm joins the sphere to a conventional X-ray machine support, and the sphere may be moved up or down the vertical support column. The sphere may also be rotated for flexibility in therapy. The sphere weighs slightly less than a ton, and the entire mechanism, including the support column, weighs about 3-tons. The attached tube provides an entrance into the interior of the lead sphere, and is the opening through which the radiation from the radiocobalt will emerge. This cobalt source will be mounted on the rim of a tungsten alloy wheel in the center of the sphere. In the "off" position, the source is encased in the center of the shielding, with the wheel itself lying between the source and the opening and serving as the shield in this direction. When "on" the wheel has been rotated half a turn, so that the cobalt is at the opening of the tube.

NEW PRODUCTS, PROCESSES, & INSTRUMENTS...in the nuclear field...

FROM THE MANUFACTURERS: Model 162A glow transfer counter has speed range of 0 to 5,000 counts per second, with a maximum capacity of 1 million counts. All counting, indication, and transfer is done within the cold-cathode glow transfer tubes, upon which the counter is based. These tubes have bright red neon glows opposite numbered circular spacings (0-9) to show accumulated count. Two of these units can be run in cascade, one feeding millions into the other. A jack in the rear of the chassis provides for remote control connection.--Atomic Instrument Co., Cambridge 39, Mass.

Single channel differential analyzer mark 15 model 2204 (developed at Oak Ridge National Laboratory, as ORNL-Q-1192, model 5). Circuit of the analyzer consists of an expander amplifier using type 404A pentodes. This tube has a gain-bandwidth product higher than any other conventional receiving tube.....Linear amplifier. mark 15 model A1C, made and tested to Oak Ridge National Laboratory specification Q-1302. This amplifier is said to retain the versatile features of the Oak Ridge A1 linear amplifier and, in addition, is modified for spectrometry applications..... Preamplifier, made to ORNL specifications Q-1302 & Q-1326, which is the latest modification of the Bell-Jordan preamplifier.--Radiation Counter Laboratories, Skokie, Ill.

Battery operated portable scaler model 2080, provides a field instrument for measurement of very low beta or gamma radiation levels where the source-to-background ratio is small. With this instrument it is said to be possible to obtain high accuracy in field measurement where conventional rate meter survey instruments are useless because their statistical accuracy is limited. The instrument contains an electronic scale-of-eight and a four digit resettable register. The electronic scaling binaries use subminiature tubes, and are designed for low battery drain and maximum reliability. A meter is used for interpolation of the binary count. High voltage supply is of the vibrator type, and is regulated at 900-volts by a corona discharge tube.--Berkeley Div., Beckman Instruments, Richomnd, Calif.

Four new radiocarbon ring labeled aromatics have now been added to this firm's list of 86 radiocarbon compounds. One of them, labeled benzaldehyde, is offered exclusively by this particular firm. The others are uniformly labeled benzene, toluene, and benzoic acid. The benzene and the benzoic acid have activities higher by a factor of 10 than any now being offered commercially. The four compounds are available in 1, 0.5, and 0.1 millicurie packages under regular USAEC licensing procedure.--Nuclear Instrument and Chemical Corp., Chicago 10, Ill.

NOTES: Radioassay units, used to automatically detect radioactivity in ore, have now been installed by the USAEC at some 28 non-uranium mining facilities in the United States. Since uranium bearing ores are frequently found in association with other base metal deposits, such as copper, lead, zinc, manganese, etc., this new sampling program at privately owned custom mills, assay offices, and smelters, may lead to the discovery of previously undetected uranium deposits. The radioassay unit being used, which was designed by the USAEC's instruments branch, in New York City, utilizes a "pill box" halogen-filled Geiger tube which can accurately detect uranium oxide in as little concentration as 0.05%. The sample, in a paper cup, is placed in a well at mid-top of the instrument, directly over the Geiger tube, and counted for one minute. The accumulated counts are then transmitted to a simple tri-colored dial where the reading is given in broad terms of (a) no radioactivity, (b) small degree of radioactivity, or (c) radioactivity at a level which might be considered uranium ore.

Nuclear instrument manufacturers, who will be among exhibitors at the Instrument Society of America's 8th annual exhibit in Chicago, Sept. 21-25, include: Beckman Instruments, So. Pasadena, Calif.; Nuclear Instrument & Chemical Corp., Chicago, who will show process control instruments utilizing radioisotope techniques; and Ohmart Corp., Cincinnati, Ohio, who will show Ohmart cells to measure various functions of density.

The USAEC's Isotopes Division, at Oak Ridge, which handles all national and international distribution of stable and radioactive isotopes, has now reorganized its technical staff. Under the new organization, the Division consists of three major branches: (1) The Allocations branch, which reviews and acts upon applications for isotopic materials, (2) Radiological safety branch, which assists radioisotope users in matters of health protection, and (3) Technical developments branch.

RAW MATERIALS...radioactive minerals for nuclear work...

UNITED STATES: A uranium ore processing plant is now to be built at Shiprock, New Mexico, by Kerr-McGee Oil Industries, Inc., who will also operate the plant. The work will be done under contract to the USAEC, through the Navajo Uranium Div., of Kerr-McGee. The USAEC has operated a sampling plant at Shiprock for the past two years, and ores produced in the northern part of the Navajo Indian Reservation have been stockpiled pending construction of a processing plant. Actual milling of the uranium ore is scheduled to begin in 1954. Of interest, is that this new mill will increase to a total of ten the number of uranium ore processing plants either in operation, or under construction, in the Colorado Plateau area of the United States .....Additional lands in Utah have now been withdrawn from the public domain for use in the USAEC's program of uranium exploration. It's part of the USAEC's effort to establish sufficient uranium ore reserves to keep uranium ore production on the Colorado Plateau at a maximum. The lands affected in this latest withdrawal are in the Blanding area, San Juan County, Utah.

CANADA: Gunnar Gold, with one of the most favorable uranium properties in the Beaverlodge area, Lake Athabaska, is now making plans to mine the orebody as an open pit, as diamond drilling indicates that this is feasible and economic for a substantial part of the orebody. Tests have shown that the main orebody has a maximum east-west width of 525-ft., and a maximum north-south length of 900-ft. The company now plans to produce a high grade uranium oxide precipitate. It is believed that this would be more profitable than producing a concentrate for sale to Eldorado Mining, for further treatment.....High initial results have been reported by Homer Yellowknife Mines as exploration proceeds on its uranium property in the Narrow Bay section, at Lake Athabaska. Scintillation counter readings in trenches put down on the only zone where blasting has been carried out have been very favorable, the company reports. Selected samples from the trenches have assayed from 0.55% uranium, to above 5.7% uranium, the company president states.....Results from the Quirke Lake group of Preston East Dome and associates indicate, the firm states, that the radioactive zone on this property extends some 8,000-ft., with widths on the few surface exposures ranging up to 25-ft. Officials of the firm observed that the mineralization was similar to Peach Uranium, which has made highly favorable finds here.

UNION OF SOUTH AFRICA: The program of uranium recovery from the tailings of gold mines in the Union now embraces some 22 gold mines here, a state official recently announced. Three mines--West Rand Consolidated, Blyvooruitzicht, and Daggafontein--have for some time now been engaged in full operation of the installed separation apparatus. It is estimated that by 1955 all twenty-two mines will be in full production. Substantial loans have been made by the United States and Great Britain to finance this operation; both these countries receive from the Union the uranium being recovered.

NEW BOOKS & OTHER PUBLICATIONS...on nuclear subjects...

Research Reports: A Listing of All USAEC Reports Issued to Date. This price list (No. 22) is a revised and cumulative listing, covering 50 reports in biology and medicine; 159 in chemistry; 123 on instruments; 59 in metallurgy and ceramics; 251 in physics; and 11 in geology and mineralogy.--Office of Technical Services, Washington 25, D.C. (n/c)

Exposure Meter For Radiography. Two reports cover work on this subject by H. Friedman and E. der Mateosian at the Naval Research Laboratory, Washington. Each report is available in microfilm ($1.75), or in photostat form ($2.50), and may be obtained under numbers PB-109449 and PB-109260 from Library of Congress, Publication Board Project, Wash. 25, D. C.

NOTES: The following reports, covering work at Britain's Atomic Energy Research Establishment, may be obtained from Brit. Info. Services, 30 Rockefeller Plaza, New York 20, at prices noted: (1) Approach to criticality of a cylindrical pile. 35¢; (2) Calculations of tolerance flux of fast neutrons. 40¢; (3) Method for the amperometric titration of thorium. 35¢; and (4) One and two group theory of cylindrical piles. $1.25.

ATOMIC PATENT DIGEST...grants, applications, & trade-marks...

GRANTS: Method and apparatus for determining frequency. Comprises (in part), means for developing a pulse of voltage in response to each positive half-cycle of a frequency modulated signal voltage (in a frequency marker pulse generator for a frequency-modulated system). Means are also provided for sharpening and amplifying these voltage pulses, as well as for passing a voltage pulse only when pulses are in phase. U. S. Pat. No. 2,647,998 issued Aug. 4th, 1953; assigned to United States of America (USAEC).

Flotation of uranium. Process of recovering uranium calues from ores and similar materials. Comprises (in part) pulping the finely divided material with water and adding a polyethylene oxide-phenol detergent, and a sodium salt of at least one fatty acid. The pulp is then subjected to flotation procedure, whereby uranium values are concentrated in the froth and may be recovered from it. U. S. Pat. No. 2,647,629 issued Aug. 4th, 1953; assigned to United States of America (USAEC).

Nuclear well logging. Comprises (in part) an apparatus for measuring the frequency of arrival of incoming particles having a characteristic energy. A detector, responsive to these particles, produces a succession of impulses representing the frequency of arrival of these particles, with the magnitude of these impulses representing the energy. U. S. Pat. No. 2,648,012 issued Aug. 4th, 1953; assigned to Perforating Guns Atlas Corp., Houston, Tex. (Inventor: Serge A. Scherbatskoy.)

Method of determining the injection profile of an injection zone of a well. Comprises (in part) injecting a first body of water into the annular space between an inner pipe and the wall of the well, injecting a second body of water containing a dissolved radioactive salt into the annular space, and forming an interfacial boundary between the two bodies of water. These bodies of water are then caused to flow downwardly through the annular space, and into the injection zone. The downward movement of the interfacial boundary is followed using a radiation detector located within the inner pipe. U. S. Pat. No. 2,648,014 issued Aug. 4th, 1953; assigned to Union Oil Co. of Calif., Los Angeles, Calif. (Inventor: Miles G. Arthur.)

System for measuring the intensity of radioactivity. Includes (in part, an ionization chamber for converting radioactivity into a proportionate electrical circuit, and a pair of tubes normally balanced to provide direct output voltages of substantially equal magnitudes. Means are also provided for unbalancing the output voltage from one of the tubes in accordance with the value of the electrical current. This difference in the output voltages from the two tubes, converted into an alternating voltage proportionate to the voltage difference, and amplified, actuates an indicator. U. S. Pat. No. 2,648,015 issued Aug. 4th, 1953; assigned to Bendix Aviation Corp., Detroit, Mich. (Inventors: Alexander Greenfield and Joseph F. Clayton.)

Incineration system. Comprises a supply line and a flue line for connection to an ash bottle through a coupling at one end, and connected to the source at the other end, with associated mechanical appurtenances. U. S. Pat. No. 2,648,348 issued Aug. 11th, 1953; assigned to United States of America (USAEC).

APPLICATIONS: Apparatus for decontaminating radioactive ships. Cleansing is done by the passage of an electrical current between the surface to be cleaned, and an electrode moved over the surface. In the case of cleaning the hull of a ship, sea water serves as the electrolyte between the two electrode surfaces. Preferably, the ship surface is made anodic, and the movable electrode is the cathode. Application No. 772,859 filed Spet. 8, 1947 by Jack De Ment, Portland, Ore.

Induction accelerator for synchrotron. This disclosure relates to an accelerating unit for use with high energy particle accelerators. Application No. 60,991 filed by United States of America (USAEC), for the inventor, John P. Blewett.

TRADE-MARKS: The letters "NDA", as a service mark, for technical research, development, design, consultant services, etc., with respect to nuclear reactors, nuclear physics, nuclear power plants, etc. Trade-mark No. 607,295 issued Aug 18th, 1953, to Nuclear Development Assoc., White Plains, N. Y.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

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